

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Original): A piezoelectric/electrostrictive film type actuator which comprises: a ceramic substrate; and a piezoelectric/electrostrictive device disposed on the ceramic substrate and including a piezoelectric/electrostrictive film and electrode film and which is driven by displacement of the piezoelectric/electrostrictive device,

characterized in that the piezoelectric/electrostrictive device wherein the piezoelectric/electrostrictive film and electrode film are alternately laminated to form the electrode film from an uppermost layer and a lowermost layer possesses a plurality of layers of piezoelectric/electrostrictive films.

Claim 2 (Original): The piezoelectric/electrostrictive film type actuator according to claim 1, wherein the piezoelectric/electrostrictive device possesses two to four layers of piezoelectric/electrostrictive films.

Claim 3 (Currently Amended): The piezoelectric/electrostrictive film type actuator according to claim 1 or 2, wherein a thickness t_n of an n-th piezoelectric/electrostrictive film from bottom in the piezoelectric/electrostrictive device satisfies the following equation:

$$t_n \leq t_{n-1} \times 0.95.$$

Claim 4 (Currently Amended): The piezoelectric/electrostrictive film type actuator according to claim 1 ~~any one of claims 1 to 3~~, wherein a thickness per layer of the piezoelectric/electrostrictive film is 30 μm or less.

Claim 5 (Currently Amended): The piezoelectric/electrostrictive film type actuator according to claim 1 ~~any one of claims 1 to 4~~, wherein at least one layer of the piezoelectric/electrostrictive films is formed by an electrophoresis deposition method.

Claim 6 (Currently Amended): The piezoelectric/electrostrictive film type actuator according to claim 1 ~~any one of claims 1 to 5~~, wherein two or more piezoelectric/electrostrictive devices are arranged on the same ceramic substrate.

Claim 7 (Currently Amended): ~~The~~ The piezoelectric/electrostrictive film type actuator according to claim 1, wherein ~~any one of claims 1 to 6 in which~~ a cavity is formed in an internal portion of the ceramic substrate, and is pressurized by deforming a part of a wall thereof with the piezoelectric/electrostrictive device,

wherein the substrate is constituted of a plurality of laminated layers of thin plates.

Claim 8 (Original): The piezoelectric/electrostrictive film type actuator according to claim 7, wherein the ceramic substrate is constituted of two or three laminated layers of thin plates.

Claim 9 (Currently Amended): The piezoelectric/electrostrictive film type actuator according to claim 7 ~~or 8~~, wherein a thickness of a thinner portion of the ceramic substrate is 50 μm or less.

Claim 10 (Currently Amended): The piezoelectric/electrostrictive film type actuator according to claim 1 ~~any one of claims 1 to 9~~, wherein the ceramic substrate is formed of a material containing any of zirconium oxide, aluminum oxide, magnesium oxide, aluminum nitride, and silicon nitride as a major component.

Claim 11 (Currently Amended): The piezoelectric/electrostrictive film type actuator according to claim 1 ~~any one of claims 1 to 9~~, wherein the ceramic substrate is formed of a material containing either stabilized zirconium oxide or completely stabilized zirconium oxide which is a major component.

Claim 12 (Currently Amended): The piezoelectric/electrostrictive film type actuator according to claim 1 ~~any one of claims 1 to 11~~, which is used as an ink pump of a printer head disposed in an ink jet printer.

Claim 13 (Original): A piezoelectric/electrostrictive film type actuator which comprises a ceramic substrate and a piezoelectric/electrostrictive device disposed on the ceramic substrate and including a piezoelectric/electrostrictive film and electrode film, and said substrate being provided with a cavity being formed in an internal portion thereof and said cavity being pressurized by deforming a part of a wall of the cavity with the piezoelectric/electrostrictive device,

characterized in that the piezoelectric/ electrostrictive film type actuator is prepared by a method of: preparing a green sheet laminate including at least one green sheet which is a substrate and one or a plurality of green sheets in which at least one hole portion is formed and sintering the green sheet laminate to obtain a ceramic laminate;

forming an electrode film (A) in the outer surface of the obtained ceramic laminate by a film forming method;

thereafter forming a piezoelectric/electrostrictive film (A) on the electrode film (A) by a film forming method, further forming an electrode film (B) on the piezoelectric/ electrostrictive film (A) by the film forming method, and repeating the forming of the piezoelectric/electrostrictive film (A) and electrode film (B) once or a plurality of times;

thereafter forming a piezoelectric/electrostrictive film (B) on the electrode film (B) by the film forming method, and further forming an electrode film (C) on the piezoelectric/ electrostrictive film (B) by the film forming method; and

sintering the piezoelectric/electrostrictive film and/or the electrode film predetermined times at an arbitrary timing during a period after the electrode film (A) is formed until the electrode film (C) is formed.

Claim 14 (Original): The piezoelectric/electrostrictive film type actuator according to claim 13, wherein a thickness t_n of the piezoelectric/electrostrictive film formed n-th time satisfies the following equation: $t_n \leq t_{n-1} \times 0.95$.

Claim 15 (Currently Amended): The piezoelectric/electrostrictive film type actuator according to claim 13 ~~or 14~~, wherein in the steps of forming and sintering the electrode film (B) at a sintering temperature T_{m1} (°C) and forming and sintering the piezoelectric/

electrostrictive film (B) at a sintering temperature T_{m2} ($^{\circ}\text{C}$), the following equation is satisfied: $0 \leq T_{m2} - T_{m1} \leq 300$.

Claim 16 (Currently Amended): The piezoelectric/electrostrictive film type actuator according to claim 13 ~~any one of claims 13 to 15~~, wherein the piezoelectric/electrostrictive film and electrode film are subjected to a plurality of film forming methods per layer and formed.

Claim 17 (Currently Amended): The piezoelectric/electrostrictive film type actuator according to claim 13 ~~any one of claims 13 to 16~~, wherein as the film forming method, at least one thick film forming method selected from a group consisting of a screen printing method, dipping method, coating method, and electrophoresis deposition method is used.

Claim 18 (Currently Amended): The piezoelectric/electrostrictive film type actuator according to claim 13 ~~any one of claims 13 to 16~~, wherein as the film forming method of the piezoelectric/electrostrictive film, the screen printing method is used first time, and the electrophoresis deposition method is used second and subsequent times.

Claim 19 (Original): The piezoelectric/electrostrictive film type actuator according to claim 13, wherein two or three green sheets in each of which at least one hole portion is formed are laminated.

Claim 20 (Currently Amended): The piezoelectric/electrostrictive film type actuator according to claim 13 ~~any one of claims 13 to 19~~, which is used as an ink pump of a printer head disposed in an ink jet printer.

Claim 21 (Original): A manufacturing method of a piezoelectric/electrostrictive film type actuator which comprises a ceramic substrate and a piezoelectric/electrostrictive device disposed on the ceramic substrate and including a piezoelectric/electrostrictive film and electrode film, and said substrate being provided with a cavity being formed in an internal portion thereof and said cavity being pressurized by deforming a part of a wall of the cavity with the piezoelectric/electrostrictive device,

characterized in that the method comprises:

a step A of preparing a green sheet laminate including at least one green sheet which is a substrate and at least one green sheet in which at least one hole portion is formed and sintering the green sheet laminate to obtain a ceramic laminate;

a step B of forming an electrode film (A) in the outer surface of the obtained ceramic laminate by a film forming method;

a step C of forming a piezoelectric/electrostrictive film (A) on the electrode film (A) by the film forming method; and a step D of further forming an electrode film (B) on the piezoelectric/electrostrictive film (A) by the film forming method to repeat the steps C and D once or a plurality of times; and

a step E of thereafter forming a piezoelectric/ electrostrictive film (B) on the electrode film (B) by the film forming method; and further a step F of forming an electrode film (C) on the piezoelectric/electrostrictive film (B) by the film forming method,

wherein sintering of the piezoelectric/electrostrictive film and/or the electrode film is performed predetermined times at an arbitrary timing during a period after the electrode film (A) is formed until the electrode film (C) is formed.

Claim 22 (Original): The manufacturing method of the piezoelectric/electrostrictive film type actuator according to claim 21, wherein a thickness t_n of the piezoelectric/electrostrictive film formed n-th time satisfies the following equation: $t_n \leq t_{n-1} \times 0.95$.

Claim 23 (Currently Amended): The manufacturing method of the piezoelectric/electrostrictive film type actuator according to claim 21 ~~or 22~~, wherein in the steps of forming and sintering the electrode film (B) at a sintering temperature T_{m1} (°C) and forming and sintering the piezoelectric/electrostrictive film (B) at a sintering temperature T_{m2} (°C), the following equation is satisfied: $0 \leq T_{m2} - T_{m1} \leq 300$.

Claim 24 (Currently Amended): The manufacturing method of the piezoelectric/electrostrictive film type actuator according to claim 21 ~~any one of claims 21 to 23~~, further comprising the steps of: subjecting the piezoelectric/electrostrictive film and electrode film to a plurality of film forming methods per layer to form the films.

Claim 25 (Currently Amended): The manufacturing method of the piezoelectric/electrostrictive film type actuator according to claim 21 ~~any one of claims 21 to 24~~, wherein at least one thick film forming method selected from a group consisting of a screen printing method, dipping method, coating method, and electrophoresis deposition method is used as the film forming method.

Claim 26 (Currently Amended): The manufacturing method of the piezoelectric/electrostrictive film type actuator according to claim 21 ~~any one of claims 21 to 24~~, wherein as the film forming method of the piezoelectric/electrostrictive film, the screen printing method is used first time and the electrophoresis deposition method is used second and subsequent times.

Claim 27 (Original): The manufacturing method of the piezoelectric/electrostrictive film type actuator according to claim 21, wherein the step A includes a step of preparing one or a plurality of laminated green sheets which form the substrate and in each of which at least one hole portion is formed.

Claim 28 (Original): The manufacturing method of the piezoelectric/electrostrictive film type actuator according to claim 27, further comprising the steps of: laminating two or three green sheets in each of which at least one hole portion is formed.

Claim 29 (Currently Amended): The manufacturing method of the piezoelectric/electrostrictive film type actuator according to claim 21 ~~any one of claims 21 to 28~~, wherein the actuator is used as an ink pump of a printer head disposed in an ink jet printer.